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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/001,820	10/23/2001	Lalit S. Shah	12942.0048 PUS00	2823

26361 7590 06/13/2003

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EXAMINER

PARSA, JAFAR F

ART UNIT	PAPER NUMBER
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1621

DATE MAILED: 06/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.  
10/001,820

Applicant(s)  
Shah et al

Examiner  
J. Parsa

Art Unit  
1621



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE three MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on Oct 23, 2001
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some\* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 4-5 6) ☐ Other:

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### DETAILED ACTION

1. Claim 1 is objected to because of the following informalities: In claim 1, line 9 the phrase "recycling the tail gas back the reactor" needs to be corrected to recycling the tail gas back to the reactor.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
4. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bohn et al (USPN 6,306,917) in view of Benham et al (USPN 6,534,552).

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Applicants' claimed invention is directed to a process for synthesizing a hydrocarbon comprising:

a) forming a synthesis gas by reacting a combustible carbonaceous material and a tail gas with 1) steam and/or water and 2) oxygen or air or enriched air at an elevated temperature in a gasification reactor;

b) contacting the said synthesis gas with a hydrocarbon synthesis catalyst to form liquid hydrocarbons and the tail gas in hydrocarbon synthesis reactor;

c) separating the resulting tail gas and the liquid hydrocarbons; and

d) recycling the tail gas back to the reactor.

Bohn teaches a process for producing power, carbon dioxide and hydrocarbons comprising steps of:

a) reacting a carbon-bearing feedstock with an oxidizing gas and steam in a partial oxidation reactor to produce a mixture of gaseous containing hydrogen, carbon monoxide and carbon dioxide;

b) reacting the synthesis gas in a Fischer-Tropsch synthesis reactor to form liquid hydrocarbons;

c) condensing the product hydrocarbons from unreacted hydrogen, carbon monoxide and other gaseous (tail gases);

d) removing at least a portion of carbon dioxide from the tail gases; and

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e) producing steam from heat recovered from at least the partial oxidation reactor and Fischer-Tropsch combined cycle plant, and directing the tail gases to the gas turbine of the combined cycle plant to produce power (see col. 7, line 34-64).

Bohan teaches for increasing the hydrocarbon yield and carbon conversion efficiency of a system part of the tail gas is recycled to the partial oxidation reactor.

The difference between Bohan and the claimed invention is that the instant claims require that the starting material contains a tail gas in addition to steam, oxygen and a combustible carbonaceous material. The Examiner notes that the tail gas is the by-product of the hydrocarbon synthesis reaction, and Bohan teaches that after removing the carbon dioxide from the tail gas, the tail gas is recycled to the partial oxidation reactor (see col. 4, line 4-8 and Figure 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add tail gas to the partial oxidation reactor in order to increase the hydrocarbon yield and carbon conversion efficiency of a system.

The dependent claims further differ in removing carbon dioxide from a fraction of the tail gas and mixing the carbon dioxide-free tail gas fraction with the synthesis gas. The Examiner notes that the primary reference separates the carbon dioxide from the tail gas. The Bohn reference is directed to production of carbon dioxide, power and hydrocarbons. However, Benham teaches that carbon dioxide is removed from the tail gas exiting from the Fischer-Tropsch reactor and recycling at least a portion of the carbon dioxide to the inlet of the synthesis gas production reactor.(see col. 2, lines 58-65). The Benham reference teaches that carbon dioxide

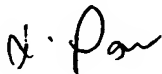
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recycle back to the synthesis gas producing step increases the yield of the Fischer-Tropsch hydrocarbons and the attendant carbon conversion efficiency (see col. 1, line 53-62). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to mix the carbon dioxide free tail gas with the synthesis gas in order to increase the yield of the Fischer-Tropsch hydrocarbons and the attendant carbon conversion efficiency.

Any inquiry concerning this communication from the examiner should be directed to J. Parsa, whose telephone number is (703)308-4615. The Examiner's normal work hours are Monday-Friday from 8:00 a.m. to 4:30 p.m. If Examiner is not in, please leave a message. Your call will be return as soon as possible. Any general inquiry of a general relating to the status of this application should be directed to the Group 1600 receptionist whose telephone number is (703)308-1235. The Examiner's supervisor, Johann Richter, may be reached at (703)308-4532. Communications may now be transmitted via FAX directly to group 1600. The group 1600 FAX machine number is (703)308-4556.

**J. PARSA**  
**PRIMARY EXAMINER**

June 10, 2003



J. Parsa